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United States Nuclear Regulatory Commission
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Improvements in Guidance for Concentration Averaging and "Difficult-to-Measure" Radionuclides

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James E. Kennedy, Sr. Project Manager
Low-Level Waste Branch
Environmental and Performance Assessment Directorate
Division of Waste Management and Environmental Protection
U.S. Nuclear Regulatory Commission

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Uniform Manifest

- Generator must properly describe, classify and report certain information to disposal facility licensee on shipping manifest
- Generator/processor must certify as correct
- Manifest contains information important to disposal facility long-term performance
  - Activity of radionuclides and classification of waste
- Information is used to ensure safe disposal of waste

NRC Guidance Related to Uniform Manifest

- Concentration Averaging and Encapsulation Branch Technical Position
- NUREG/BR-0204, "Instructions for Completing NRC's Uniform Low-Level Radioactive Waste Manifest"
- Both affect information that generators must supply to disposal facilities

Concentration Averaging Branch Technical Position

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10 CFR 61.55(a)(8) Concentration Averaging

- "The concentration of a radionuclide [for the purpose of classifying waste] may be averaged over the volume of the waste, or weight of the waste if the units are expressed in nanocuries per gram."

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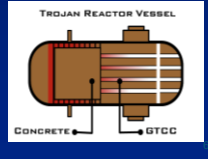
An Example—Disposal of the Trojan NPP Reactor Vessel



Concentration Averaging and Encapsulation BTP

- Guidance on how to meet 61.55(a)(8)
- Used to classify waste as A, B, or C
- Ensures that "hot spots" in LLW do not pose a hazard to a potential inadvertent intruder
- Answers these questions:
  - How much waste above the classification limits is acceptable?
  - How much more concentrated than the limit can this waste be?
  - Over what volumes must these concentrations be measured?
- BTP also constrains mixing of non-radioactive materials with LLW (dilution)

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Improvements in CA BTP

- Revisions to 1995 version
- More risk-informed
  - Mixtures of solid items—hottest item tied to waste class limit, not average concentration of mixture
  - Sealed sources
  - Cartridge filters
  - Blending of LLW—focus on outputs not inputs
  - Uses reasonably forseeable. yet conservative intruder scenarios to establish acceptable "hot spots"
- More performance-based
  - Revised regulatory approval process for different approaches
- Improved clarity
  - More transparent and detailed technical basis
  - Written for wider audience

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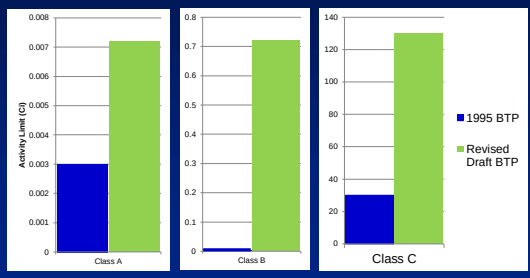
Sealed Source Activity Limits (Table A in BTP) – Cs-137



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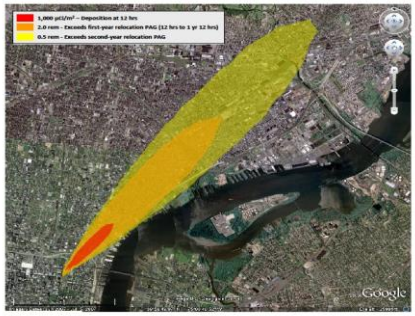
Radiological Dispersal Device



Courtesy of U.S. EPA

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Outcomes

- More waste disposed of based on its hazard
- Reduced worker doses
- Improved knowledge management
- Possibility of more waste- or site-specific approaches

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More Information

- Final revised version to be published later this year
- Draft revised version: May 2012 Concentration Averaging and Encapsulation BTP Rev. 1 (ML121170418)
- Current version: 1995 Concentration Averaging and Encapsulation BTP (ML033630732)

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Reporting of Difficult-to-Measure Radionuclides

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Background

- Tc-99, I-129, H-3, and C-14 identified in Part 61 rulemaking (Cl-36 identified later)
- Long-lived, mobile, may affect offsite doses to member of public
- Must be reported on uniform manifest (per NUREG/BR-0204)
- For difficult-to-measure nuclides, LLD's often reported

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Issue

- LLW disposal facility operators receive unnecessarily conservative radioactivity reports from generators
- Disposal sites may close prematurely for exceeding limits for DTM nuclides

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Results of March 1 Workshop

- C-14, H-3, and Cl-36 not as big an issue as Tc-99 and I-129
- Resolution of problem may not entirely reside with the NRC:
  - Use of generic scaling factors
  - Longer count times or use of mass spectrometry
- Adverse consequences to be avoided
- Accuracy vs compliance--tradeoffs

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Next Steps

- Analyze comments received at workshop
- Public Webinars
  - State Focused (tentatively 4/13)
  - Stakeholder Focused (tentatively 5/13)
- Publish Draft
- Public Meeting or Webinar
- Publish Final

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Summary

- NRC continues to improve LLW disposal regulatory framework
- Revisions ensure safe, secure disposal of LLW

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